

ABSTRACT

A new method to form a VLSI-photonics heterogeneous system device is achieved. The method comprises providing an optical substrate comprising at least one passive optical component formed therein. An electronic substrate is provided comprising at least one active electronic component formed therein. A plurality of metal pillars are formed through the optical substrate and protruding out a first surface of the optical substrate. A plurality of metal pads are formed on a first surface of the electronic substrate. The optical substrate and the electronic substrate are bonding together by a method further comprising aligning the first surfaces of the optical and electronic substrates such that the protruding metal pillars contact the metal pads. The optical and electronic substrates are then thermally treated such that the metal pillars bond to the metal pads.